

## REMARKS

Applicant again notes there is an outstanding Petition To Correct Inventorship mailed November 3, 2004 and listed on PAIR with a November 8, 2004 date. Applicant again requests that this petition be processed.

Reexamination and reconsideration of the application are requested.

Please see the previous May 9, 2007 Rule 132 Declaration of Foster B. Stulen and the enclosed Declaration Under Rule 132 of Foster B. Stulen in support of the following remarks. The enclosed Rule 132 Declaration is directed solely to the Reichenberger patent (US 5,370,121) which was first cited by the examiner in the present 8/3/07 final office action. Applicant could not earlier present the enclosed Rule 132 Declaration because the examiner first cited the Reichenberger patent in the present 8/3/07 final office action.

The Examiner's rejection of claims 1-32 as being "obvious", under 35 U.S.C. 103, is respectfully traversed. The Examiner rejects these claims as being unpatentable over Okazaki '580 or Lizzi '726 and, as required, in view of newly cited Reichenberger (US 5,370,121), Dory (US 5,534,258), Cain (US 5,590,657), Geiser (US 6,106,470), and/or Fujimoto (US 6,540,700). In view of the previously amended claims, the "further in view of" Watkins and Acker references add nothing to the claim rejection.

The independent claims 1, 13, 16, 25 and 30 require subtracting a second time-varying signal (or imaging signals of a second image frame or of a second set of image frames) from a first time-varying signal (or imaging signals of a first image frame or of a first set of image frames) to derive a time-varying difference signal (or a set of time-varying difference signals). The examiner seems to reject these independent claims based on Okazaki, Lizzi and/or Reichenberger. The Okazaki, Lizzi, and Reichenberger patents, taken alone or in combination, do not teach, suggest or describe this.

Two items are key to understanding the difference between the claims and the Okazaki, Lizzi, and Reichenberger patents. One is to understand that two time-varying signals from the same location are being subtracted in the claims whereas two signal-amplitude-dependent image

pixel values from the same location in two images are being subtracted in the Okazaki, Lizzi, and Reichenberger patents. The other is to understand that the term "amplitude" as used in the Okazaki and Lizzi patents, and as used by the examiner for the Reichenberger patent, means a number, such as a peak amplitude or an average amplitude, which is time-invariant (fixed) for a particular time-varying signal (but which can change for the next time-varying signal).

The Okazaki, Lizzi, and Reichenberger patents each: determine a first time-invariant amplitude value (such as a maximum amplitude value from a normal or equilibrium value taken as zero or an RMS [root-mean-square] average amplitude value, etc) of the first time-varying signal; then determine a second time-invariant amplitude value of the second time-varying signal; and then subtract the second time-invariant amplitude value from the first time-invariant amplitude value to derive a time-invariant number (for that particular pair of time-varying signals), wherein the time-invariant number is used to determine a gradation value of a pixel of a location in an image and wherein the pixel gradation value is a fixed value until new signals are received and processed. The subtraction in the claims yields a time-varying signal whereas the subtraction in the Okazaki and Lizzi patents yields a fixed (time-invariant) number.

Okazaki discloses subtraction of the amplitude of two signals. Okazaki teaches detecting the amplitude of the signals (see column 3, lines 22-25) which a signal converting system outputs as tomogram data to an image memory (see column 3, lines 39-41), and a subtraction image is formed from the stored tomogram data (see column 3, lines 41-44). Tomogram data is fixed amplitude data from particular signals (which can change for later signals). Okazaki teaches that a pixel gradation value for a location (see the particular level of gradation lightness or darkness for a particular pixel location in Okazaki's figure 4C) is derived by subtracting a fixed amplitude value of a same-particular-location-reflected time-varying second signal during treatment (see the particular level of gradation lightness or darkness for a same particular pixel location in Okazaki's figure 4B) from a fixed amplitude value of a same-particular-location-reflected time-varying first signal (see the particular level of gradation lightness or darkness for a same particular pixel location in Okazaki's figure 4A) before treatment.

Lizzi teaches subtraction of image scans (see Lizzi's blocks 340 and 345) which, for a particular pixel location in an image scan, are subtractions of fixed amplitude values of signals identical to the teaching of Okazaki. Subtraction of image scans is subtraction of images (see the Abstract of Lizzi) which is the subtraction of signal-amplitude-dependent pixel values.

Reichenberger, and especially column 7, lines 19-52 and column 12, lines 4-17 thereof, is cited by the examiner to support the examiner's assertion (on page 3 of the present final office action) that, "Reichenberger evidences that the art recognized an equivalence for purposes of differential tracking of temperature change during treatment (by imaging across whole frames or a "ROI or individual echo lines) between amplitude/intensity data as stored in a pixel memory subsequent to receive processing 11 and signals as for example directly stored in a memory and/or processed in time-intensity wavetrace form." The examiner also asserts (on page 4 of the present final office action, "... Reichenberger et al evidences the equivalence between use of image data and echo signals such as time-varying waveform signals as discussed above." The examiner additionally asserts (on page 7 of the present final office action), "Reichenberger ... teaches ... either the image frame data or time-varying signals may be used as the inputs to the subtraction/differencing stage."

Please see the enclosed Rule 132 Declaration for a discussion of the differences between the claims and Reichenberger.

The subtraction in Okazaki and/or Lizzi and/or Reichenberger is derived from the time-invariant amplitude values of a particular before-treatment signal (i.e., a first signal) and a particular during-treatment signal (i.e., a second signal) and is a fixed number and is not a time-varying difference signal. A different fixed number for Okazaki and/or Lizzi and/or Reichenberger can be derived by subtracting the time-invariant amplitude values of an additional new third signal and the previous second signal or by subtracting the time-invariant amplitude values of additional new third and fourth signals. However, subtracting fixed amplitude values of third and second signals or fixed amplitude values of third and fourth signals to derive a different fixed number from the fixed number derived by subtracting fixed amplitude values of

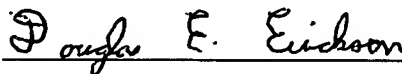
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Attorney Docket No.: END5042USCIP  
Amendment After Final

first and second signals is not subtracting a time-varying second signal from a time-varying first signal to derive a time-varying difference signal.

A question might be raised whether the difference in time-invariant amplitude values of two time-varying signals is the same as a time-invariant amplitude value of the difference of two time-varying signals. The answer is no (see page 8, lines 4-7 of the specification). For example, consider a time-varying sine wave signal [ $y_1 = \sin(x)$  where  $x$  is time] having a fixed amplitude value of one and a time-varying cosine wave signal [ $y_2 = \cos(x)$ ] having a fixed amplitude value of one. The difference in the fixed amplitude values of the two signals is zero. However, subtracting the cosine wave signal from the sine wave signal results in a signal [ $y_3 = \sin(x) - \cos(x)$ ] which has a fixed amplitude value of about 1.4 which is not a fixed amplitude value of zero. It is noted that Attachment A of the 11/14/05 Amendment After Final was a graph of  $\sin(x)$ ,  $\cos(x)$  and  $\sin(x) - \cos(x)$ .

Inasmuch as each of the rejections has been answered by the above remarks and Rule 132 Declarations, it is respectfully requested that the rejections be withdrawn, and that this application be passed to issue.

Respectfully submitted,

  
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